Claims:

1. A coupled enzymatic reaction system having a cofactor-dependent enzymatic transformation of an organic compound with an alcohol dehydrogenase and an enzymatic regeneration of the cofactor in a two-phase solvent system, wherein an aqueous phase is in contact with a liquid organic phase and the organic compound is present in a concentration of > 25 mM per L of total volume of the solvents.

2. Reaction system according to Claim 1, characterised in that the organic solvent employed possesses a solubility in water that is as low as possible and a solubility in respect of the organic compounds employed that is as high as possible.

3. Reaction system according to Claim 1 and/or 2, characterised in that aromatic or aliphatic hydrocarbons that are liquid under the reaction conditions are employed as organic solvent.

4. Reaction system according to one or more of the preceding claims, characterised in that the organic solvent is present in a quantity amounting to 5 - 80 vol.% in relation to the total volume of the solvents.

5. Reaction system according to one or more of the preceding claims, characterised in that the system contains no surfactants.

6. Reaction system according to one or more of the preceding claims, characterised in that

the organic compound is present prior to the start of the reaction in a concentration of > 100 mM per L of total volume of the solvents.

7. Reaction system according to one or more of the preceding claims, characterised in that NADH or NADPH is employed as cofactor.

8. Reaction system according to one or more of the preceding claims, characterised in that an alcohol dehydrogenase derived from Lactobacillus kefir is employed as enzyme for the transformation of the organic compound.

9. Reaction system according to one or more of Claims 1 to 7, characterised in that an alcohol dehydrogenase derived from Rhodococcus erythropolis is employed as enzyme for the transformation of the organic compound.

10. Reaction system according to one or more of the preceding claims, characterised in that regeneration of the cofactor is effected by a formate dehydrogenase, preferably that derived from Candida boidinii or mutants thereof.

11. A device for the transformation of organic compounds, having a reaction system according to one of Claims 1 to 10.

12. A process for the enzymatic transformation of organic compounds by application of the reaction system according to one of Claims 1 to 10.

13. Use of the reaction system according to one of Claims 1 to 10 for the enzymatic transformation of organic compounds or for the diagnosis or analysis of, preferably, alcohols.

14. Use according to Claim 13 in a process for preparing enantiomer-enriched organic compounds, preferably alcohols.